

## REMARKS

The office action of December 14, 2004, has been reviewed and its contents carefully noted. Reconsideration of this case, as amended, is requested. Claims 15-21, 23, 25, 26, 28-33, and 36-41 remain in this case. Claims 1-12 were previously cancelled. Claims 13-14, 22, 24, 27, 34-35 are cancelled and claim 41 is added by this response.

### **Preliminary Comments**

- a. The numbered paragraphs below correspond to the numbered paragraphs in the Office Action.
- b. (1.) The Applicant notes that the preliminary amendment dated August 10, 2001 has been entered and examined.
- c. New Claim 41 is the equivalent of claim 35 as filed, and is entered (and claim 35 cancelled) to make the claim numbering more logical in response to Examiner's objection 3.1. No new matter is added.

### **Objections to the Specification / Claims / Abstract / Drawing**

- 2. The substitute specification and the "Marked-up copy of replacement specification" submitted in the preliminary amendment dated August 10, 2001 were objected to.

As to the allegation that the substitute specification does not show changes relative to the marked-up copy when compared to the original, the Applicant respectfully disagrees. The Office compares the original spec at pages 25-26 to the marked-up copy at pages 25-26 and does not find matching text to create the substitute specification at pages 25-26. The applicant respectfully submits that comparing versions of the specification page by page is inaccurate because the nature of inserting and deleting text (while adding no new matter) will naturally cause the paragraphs which are present on an original specification to shift location (page and line number) on the substitute specification. The nature of computer-generated comparison, which is the most accurate way of comparing two documents, nonetheless does not permit a page-by-page equivalence as text is added and deleted.

In order to comply with the Examiner's requirement, attached herewith is a new corrected marked-up specification which does not contain handwritten marks or comments, and which reflects the comparison of the specification as filed and the replacement specification filed August 10, 2001, as generated by the Applicant's computer program, Microsoft Word 2003. Again, it should be noted that the pagination of the original, substitute and marked-up versions of the specification will vary slightly, as is normal when text is moved, deleted or added. Nonetheless the strikethrough and underlining indicating deletions and additions is correct.

In making the comparison, the Applicant's attorney noticed that when the replacement "clean" specification was submitted in August, 2001, page 36 was inadvertently submitted in "marked up" rather than "clean" form. A substitute "clean" page 36 is attached to this amendment. Please substitute this clean page for the marked-up page 36 submitted in August 2001. The marked-up copy of the specification submitted with this amendment correctly shows the differences between the text submitted originally and this clean page.

The Applicant has reviewed the changes in the marked-up copy, and can find no inconsistencies with the text of the substitute specification. When the deleted text shown in the marked up copy is removed to make the substitute specification, the pages on which a given paragraph or equation is located will naturally change. Reconsideration and withdrawal of the objections to the substitute specification are respectfully requested.

3.1 Claims 13-40 were objected to under 37 C.F.R. § 1.75(g) because dependent claims did not appear to be grouped together.

The following changes were made to make the claim grouping more logical:

- a. Claim 35 was cancelled and re-entered as claim 41.
- b. Claim 25 was made dependent upon claim 23 (rather than cancelled claim 14)
- c. previously independent claim 32 was made dependent on claim 28

Applicant believes the claims are now grouped logically. Reconsideration and withdrawal of the objection for claim organization is respectfully requested.

### Rejection(s) under 35 U.S.C. §112

4.1 Claims 28-31 and 37-38 were rejected under 35 U.S.C. §112 second paragraph as being indefinite for failing to particularly point out and distinctly claim the subject matter which the applicant regards as the invention.

However, the Examiner gave no reason for this rejection, and lacking a reason, Applicant is unable to respond to the rejection. The Applicant respectfully requests reconsideration and withdrawal of the rejection. If the Examiner wishes to maintain the rejection, the Applicant respectfully requests specific wording and phrasing from the claims which the Examiner believes are lacking under 35 U.S.C. §112 so that a response may be made to such a rejection.

4.2 Claims 28-31, 33, and 36-39 were rejected under 35 U.S.C. 112, P2 as being incomplete for omitting essential steps, such omission amounting to a gap between the steps. The Office Action alleges that the omitted steps are the steps that take the local optimal solutions and determine a global optimal solution, as recited in the preamble of independent claim 28.

Independent claim 28 has been amended to recite the step of "c) choosing a global optimal solution from the local optimal solutions found in step (b)." Claims 29-31 and 36-39 are directly dependent on independent claim 28, and thus this amendment should also complete the method for these claims, as well. Applicant believes that this addresses the Examiner's concern, and that the claim is now in condition for allowance. Reconsideration and withdrawal of the rejection is respectfully requested.

4.3 Claims 37-38 were rejected under 35 U.S.C. §112, second paragraph for troubles with antecedent basis. Claims 37 and 38 have been amended to correct the antecedent basis. Specifically:

Claim 37(c) - "the objective function (0) of (4.5)" - this has been amended to --an objective function C(x) of (4.5)--

Claim 38(c) - "the hybrid search method" - this has been amended to --a hybrid search method--

Claim 38(g) - "manifold of system (4-9)" - this has been corrected by amending claim 38 to depend on claim 30, which contains the term "manifold..." in step 30(b). Also, the equation number has been corrected from "(4-9)" to --(4.9)--

Claim 38(h) - "for Phase using" - corrected to --for Phase II using--

Applicant believes these amendments completely correct the deficiencies noted by the Examiner. Reconsideration and withdrawal of the rejection is respectfully requested.

### **Rejection(s) under 35 U.S.C. §101**

5.1-5.3 Claims 13-40 were rejected under 35 U.S.C. §101 for reciting a process that is not directed to the technological arts.

As suggested by the Examiner, all of the independent claims have been amended to be recited to be "computer-implemented" methods, which is indeed directed to the technological arts. The Applicant believes that, with this amendment, all of the claims now recite patentable subject matter and are thus allowable. Reconsideration and withdrawal of the rejection are respectfully requested.

5.4-5.6 Claims 13-40 were rejected under 35 U.S.C. §101 for reciting a process comprising an abstract idea.

All independent claims have been amended to include a step of displaying the results of the claimed method (i.e. the dynamical decomposition point (claim 15), the local optimal solution (claims 23 and 40), or a global optimal solution (claims 26 and 28)), which is a post-mathematical operation which addresses this rejection. Reconsideration and withdrawal of the rejection is respectfully requested.

### **Rejection(s) under 35 U.S.C. §102**

6.1 Claims 13-15, 22, 24, 28-31, and 32-35 were rejected under 35 U.S.C. §102(b) as being anticipated by Chiang et al, "A Systematic Search Method for Obtaining Multiple Local

Optimal Solutions of Nonlinear Programming Problems” (hereafter referred-to as “Chiang”).

Preliminarily, it should be noted that claims 13-14, 22, 24, and 34 are cancelled by this response, making the rejection moot as to these claims. Claim 35 has been cancelled and replaced by claim 41 - for the purpose of this response, the new claim will be treated as equivalent of the original. This leaves claims 15, 28-31, and 32, 33 and 41 (equivalent of 35) subject to this rejection. Of these claims, claims 15, 28 and 41 are independent.

#### 6.2 Regarding claim 13...

Claim 13 is cancelled.

#### 6.3 Regarding claims 14, 22 and 32...

Claims 14 and 22 are cancelled. Claim 32 is now amended to be dependent upon claim 28, and should be allowable for the same reasons as that claim. See discussion following 6.6, below.

#### 6.4 Regarding claims 15 and 23...

Claim 15 is a *specific method* of computing a dynamical decomposition point (DDP) of a stable equilibrium point for large-scale nonlinear systems, *comprising a specific series of steps*: (a) starting at a stable equilibrium point; (b) moving along a search path to find an exit point; (c) using the exit point and integrating; and (d) computing the DDP (plus added step (e) of displaying the result). The method described in Chiang, page 105, is a method of finding a decomposition point using the reflected gradient method - *a different method entirely than that claimed in claim 15*. None of the steps described in the paper are duplicated in claim 15. Therefore, claim 15 is novel over the Chiang reference.

Claim 23 was not listed as rejected under this section, although it is discussed by the Examiner in this paragraph (see paragraph 6.1). In the interest of completeness, it will be discussed here.

Claim 23 is a *specific search method for obtaining a local optimal solution, comprising a specific series of steps*: (a) starting at an initial point; (b) integrating a nonlinear dynamical system...; (c) monitoring a desired convergence performance criterion...; and (d) applying a local optimizer... (plus, again, the added step of displaying the result). The method described in Chiang, page 105, is a *method of finding a decomposition point* using the reflected gradient method - *a different method of finding a different result than that claimed in claim 23*. None of the steps described in the paper are duplicated in claim 23. Therefore, claim 23 is novel over the Chiang reference.

Reconsideration and withdrawal of the rejection is respectfully requested.

#### 6.5 Regarding claim 24...

Claim 24 has been cancelled.

#### 6.6 Regarding claims 28-31 and 33-35...

The Chiang reference describes a search method for *unconstrained* nonlinear programming problems - see page 100, left-hand column [emphasis added]:

II. Problem Formulation

Consider the following unconstrained global optimization problem ...

Claims 28 and 41 (equivalent of 35), in contrast, are methods for obtaining global (claim 28) or local (claim 41) optimal solutions of constrained nonlinear programming problems:

28. (Currently Amended) A computer-implemented method for obtaining a global optimal solution of constrained nonlinear programming problem (4.5), comprising two phases:

41. (New) A computer implemented method for obtaining a local optimal solution of nonlinear constrained optimization problem (4.5) under study, starting from a feasible solution, comprising the steps of:

Thus, both claims describe methods of dealing with problems which are inherently different (constrained vs. unconstrained) from those dealt with in the Chiang paper. In addition, both claims present specific methods for obtaining the local or global solutions which are not shown in the paper. By presenting different methods of obtaining solutions to different classes of problems, the claims are not anticipated by the reference. Reconsideration and withdrawal of the rejection is respectfully requested.

Claims 29-33, being dependent upon claim 28, should be allowable for the same reasons as discussed above. Reconsideration and withdrawal of the rejection is respectfully requested.

Claim 34 is cancelled.

#### **Rejection(s) under 35 U.S.C. §103**

7.1 Claim 27 was rejected under 35 U.S.C. 103(a) as being unpatentable over Chiang, et al, in view of common knowledge regarding optimization.

Claim 27 has been cancelled, making this rejection moot.

Reconsideration and withdrawal of the rejection are respectfully requested.

#### **Allowable Subject Matter**

8.1 and 8.2 The examiner indicated that claims 16-21, 25-26, 36-39, and 40 would be allowable if rewritten to overcome the rejections under section 101 and 112.

The claims have been rewritten, and allowance of the claims is respectfully requested.

#### **Conclusion**

Applicant believes the claims, as amended, are patentable over the prior art, and that this case is now in condition for allowance of all claims therein. Such action is thus respectfully requested. If the Examiner disagrees, or believes for any other reason that direct contact with Applicants' attorney would advance the prosecution of the case to finality, he is invited to telephone the undersigned at the number given below.

"Recognizing that Internet communications are not secured, I hereby authorize the PTO to communicate with me concerning any subject matter of this application by electronic mail. I understand that a copy of these communications will be made of record in the application file."

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